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Solid Waste Management Pollution: A Case Study with Kishtwar Perspective of Jammu Region of J&K (India)

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ABSTRACT

Waste management (SWM) is a worldwide phenomenon and is a great concern in urban life in every city of the world. Developed countries of the world are viewing waste as their assets and converting waste into wealth. They use modern disposal and recycling technologies as well as state of the art equipments and ensuring their dwelling neat and tidy. SWM is a big challenge all over the world. Recycling is often viewed as an important aspect of an efficient and effective solid waste management system in the developed countries. The problem of solid waste management (SWM) is also prevailing in the Municipal environment of Kishtwar. Waste disposal and recycling is carried out in traditional way and same is disposed off in the open space without processing and not taking any precaution to protect the environment. This paper discussed about the role of organized cluster of households' solid waste disposal, recycling and extracting benefits out off these waste in general and how employment can be generated from the garbage. Paper also suggested the involvement of community and Government initiatives to aware the city dwellers about waste isolation, classifications, collection, recycling and disposal.

KEYWORDS: *Waste Management, Pollution, Solid Waste, Waste Recycling*

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INTRODUCTION:

There has been a significant increase in solid waste (SW) generation in India in the last few decades. This is largely because of rapid population growth and economic development in the country. The increased solid waste (SW) generation can be ascribed to our changing lifestyles, food habits and change in living standards. In India the amount of waste generated per capita is estimated to increase at a rate of 1%-1.33% annually [1-3]. It is estimated that the total waste quantity generated in by the year 2047 would be approximately about 260 million tons per year, more than five times the present level of about 55 million tons. The enormous increase in solid waste generation will have significant impacts in terms of the land required for waste disposal [4,5].

It is estimated that if the waste is not disposed off in a more systematic manner, more than 1400 sq. km of land which is equivalent to the size of city of Delhi would be required in the country by the year 2047 for its disposal [6]. Solid waste management is an integral part of urban and environmental management, like most of other infrastructural services has come under great stress, consider low priority areas, solid waste management was never taken up seriously either by public or by concerned agency or authorities and now the piled up waste is threatening our heath, environment and well-being [7]. Waste, when not manage properly, can pose serious health hazard [8,9]. Therefore, waste management is an important issue that needs effective solutions. With the booming economy and increasing population, the accumulation of waste has become an increasingly arduous issue and has aroused the attention from all sectors of society.

Kishtwar's daily production of solid waste is almost 5-6 tons per day [10]. Out of which around 0.5-1 tons still remains on the streets and roads, that means lifting efficiency is around 80%. There is none of data published on the composition of waste in Kishtwar, although the figures of India in generally are reasonably accurate depiction for Kishtwar also. In India, the composition of waste is around 50% biodegradable, 25% inert waste 9% plastic, 8% paper, 4% scraps, and 1% glass[11]. The composition of different wastes keeps varying from season to season. In the summer time there is more biodegradable waste produced because of more vegetation. The composition of plastic in waste has probably been decreasing due to the recent ban on plastic bags[12].

Waste is created from the house, market or business hub or commercial building or organization above all where the people are working or residing waste is following. Waste is considered as a problem in our daily life, people want to avoid waste and always try to leave neat and clean. Though waste is unwanted and rather not desirable but there is no denying fact that it is obvious. So fight or disposed off the waste in such a way that it would not be problematic for the people. So if the cause of waste can be carefully monitor and regulate then it will be easy to manage the waste though it may not be possible to stop producing waste[13]. Solid waste management was selected as the topic of this study because it is a visible environmental sustainability issue that India is confronting, since Kishtwar is a rapidly developing

town, effective waste management practices is especially needed. The objective of the study was to learn as much as possible about Kishtwars SWM through a broad-based approach.

In this paper focus is drawn on waste management in a cluster of community or certain areas of town Kishtwar. Main focus of this paper is to proper dispose off the waste from the household kitchen to the storage tank or collecting the organic or dry waste to the final treatment plant and recycling of dry waste and produce sustainable reusable products, energy generation, organic manure production, organized manure use at the peri-urban area for cultivation of vegetable and food grain. Creating awareness among the city dwellers, incentives criterion to popularize the issue among the municipal population and role and benefits of the Community/Mohalla Committees/Social organizations, responsibility and involvement of various government organs are also spelled out in the paper.

Materials and Methods

In this paper, we explore the case study of Kishtwar town, where various attempts are made by citizens and ward/mohalla organizations to make an effort to manage their waste in a decentralized manner. In our present study was focused to different wards of Kishtwar Municipal limits. The sampling of the report has case studies of Secondary data regarding solid waste generation, collection system and disposal methods which were collected from different households and from Kishtwar Municipal Committee comprising of 13 wards comprising of 2,710 households.

Analysis and discussions

Kishtwar District one of the hilly districts of the state of Jammu and Kashmir of India is decorated with natural beauty coupled with neat, clean and green environment. As of 2011 census, it is the least populous district of Jammu and Kashmir Union Territory. Block Kishtwar is the 1st block of Kishtwar District with only Municipal Committee (city) in the District. The Kishtwar city is divided into 13 wards and has a population of 14,865 of which 8,179 are males while 6,686 are females as per report released by Census 2011 of India [10]. Kishtwar Municipal Committee has total administration over 2,710 houses spread over an area of 2.02 square kilometers to which it supplies basic amenities like water and sewerage. The statistical information of Kishtwar Municipal limits and average production of solid waste (in kg) per day is presented in table-1.

Kishtwar Municipal Committee is responsible for collection of solid waste which is produced day by day from different areas of Kishtwar Town. They collect the waste from the secondary collection point and disposed off the same at designated dumping place. There are several sources for solid waste generation in this city like, Markets, Play Ground/streets, Domestic Buildings/Houses, Educational Institutions, Offices, Hospital etc. Cleaners, sweepers are distributed among the various wards/zones they work under the guidance of Chairman Municipal committee but the results are not satisfactory. Because of resource constraints and many other reasons, they have not been able to provide a satisfactory waste management system in their respective areas.

Ward No	Area in Sq. Kms	No. of House Holds	Population as per 2011 census	Average generation of SW T/Day	Average collection (Tons/day)	No. of Sites used for Land Fill
1	0.071	162	944	0.35	0.32	Nil
2	0.047	190	961	0.55	0.51	Nil
3	0.046	221	119	0.45	0.40	Nil
4	0.309	250	1269	0.45	0.41	Nil
5	0.0.094	176	915	0.35	0.32	Nil
6	0.040	126	674	0.25	0.22	Nil
7	0.142	252	1296	0.35	0.31	Nil
8	0.054	261	1301	0.55	0.50	Nil
9	0.266	140	673	0.35	0.32	Nil
10	0.316	202	1058	0.35	0.32	Nil
11	0.096	105	528	0.45	0.40	Nil
12	0.210	247	1334	0.55	0.52	Nil
13	0.328	378	2793	0.50	0.45	Nil
	2.2	**2710**	**14865**	**5.5**	**5.0**	Nil

Table 1: Statistical data of Kishtwar municipality as per census 2011

Disposal of waste

At present, Total volume of municipal solid wastes in the town is 5.5 tons/day which comprise of both of biodegradable and non biodegradable waste. Out of household/commercial waste generated form houses/ market/ bazaar, hotel/restaurants, commercial complex etc contain organic waste and dry waste. Composition of organic waste are kitchen waste, human waste, garden waste, agriculture waste, leaves of fruits, vegetable pieces, waste grain, seed of any plant species as well as non-marketable or non-edible seeds. Kitchen waste contains starch, sugar, cellulose or protein etc. Compositions of dry waste are paper, plastic, metal, glass, rags etc. Collected garbage is transported to the disposal areas in specific manner. It starts from small dustbins and ends into big dust bins from where it is transported to disposal/dumping sites. The collected garbage is disposed off without any segregation, treatment and recycling. So till now there is no recycling procedure of garbage according to the normal specification i.e. Municipal Solid Waste (Management & Handling) Rules 2000 of solid waste treatment[7,11].

Sanitary Land Fill	Incinerated	Open Dump	Recycled	Burned Openly	Others
No	No	Yes	No	Yes	-------

Table 2

Segragation of Solid Waste	Biodegradable	Non-Biodegradable	Dry	Wet	Hospital waste
	No	No	No	No	No

Table 3

Table: Disposal method of Solid waste in Kishtwar Municipality Area

Conclusion

Waste management is not a new issue, but quite a mature issue to the world. A nation can be judged to study her environment. Developed countries of the world has viewed waste as their assets and converting waste into energy. They have the state of the art waste handling and recycling modern and efficient tools they have the latest technology and striving to achieve more effective technology for proper and perfect management of waste. The solid waste management in Kishtwar appears to be inadequate and needs up gradation. The solid waste has to be disposed of scientifically through sanitary landfill and recyclable portion of the waste should be retrieved back. Segregation of recyclable material would also leads to reduction in quantity of solid waste for final disposal. Higher priority needs to be assigned to the management of municipal solid waste by the local authority and a system approach needs to be adopted for optimizing the entire operation of SWM encompassing segregation at source, timely and proper collection, transportation and proper operation of sanitary landfill site.

The density of population along with number of offices and institutions are continuously increasing thus there should be effective management activity for managing the solid waste which is generated daily in the town. Apart from this it is suggested that the community based organizations (CBO) can be the effective solution for waste management. Now a day urban people live in various communities for many reasons, it also offers multifarious benefits to the dwellers. If these community works together to fight waste, live green and to mitigate unemployment problem then it will be possible. CBOs should have managing committees, which will be responsible to recruit necessary man power for multidimensional initiative like production of bio gas from organic waste, bio-fertilizers, vermin composting /vermin wash units, to operate the recycling unit, waste collection unit, manure production and distribution unit etc.

Proper motivation and strict instruction must be given to the house member or maid/boy to properly isolate the waste and keep proper bins. Educate the house staff regarding the heath and environment issue of the waste. There may be some benefits for individual dwellers such as:

A. Organic waste can be use for producing bio gas which may transform into energy in many forms for domestic/commercial or vehicular use.
B. Byproduct of bio gas is good organic manure which can be use for peri agriculture project.
C. Dry waste can be recycled and financial benefits may be derived out of that.
D. Major portion of the urban waste will be disposed off by the Community Based Organizations.
E. Once the CBO function efficiently there will be no cost of disposing waste from house /commercial place.
F. Pressure on natural gas as well as energy will be reduced.
G. Fertilizer requirement for agriculture will be partially solved.
H. Unemployment problem will be partially solved.
I. Surroundings environment will be clean, air pollution will be less.

In this connection government encouragement, incentive, publicity, sponsorship can be the vital matters to consider in depth. All level of the government body should come forward to materialize the CBO initiative. For doing so public awareness should be created through publicity in electronic and print media. Incentive may be provided to draw the people attention and generate interest to work with various clusters of the town to handle waste disposal issue.

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